Space Weather Forecast

Issued on Tuesday, 13 August 2024 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: A chance of G1-G2/Minor-Moderate geomagnetic storms day 1 and day 2 (13/14 Aug). Moderate class flares likely with a slight chance of isolated strong class flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with a single low level Moderate class flare observed, originating from the northeast. There are ten sunspot regions visible on the disc. The largest region is in the southwest, displaying a complex magnetic structure with at least two weak delta spots. Another large and complex spot resides in the northeast and has a somewhat unusual configuration. All other spots are small and simple.

A suspected filament eruption was observed in the southwest of the disk around 13/0800UTC, though any coronal mass ejection is proving slow to appear in imagery and is therefore yet to be analysed. No further Earth-directed coronal mass ejections were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of active coronal mass ejection magnetic cloud conditions, with a very gradual exit. Solar wind speeds were slightly elevated throughout, but gradually eased. The Interplanetary Magnetic Field was strong, peaking at 13/0350UTC before slowly easing to moderate to end the period. The north-south component started strongly negative before slowly rotating to positive by 13/0000UTC and remaining so thereafter. Geomagnetic activity was initially at G4/Severe storm (Kp8) levels, before gradually becoming Quiet to Unsettled (Kp 2) to end the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High solar activity is forecast, with Moderate-class flares considered likely and a slight chance of an isolated Strong-class flare.

Solar Wind /Geomagnetic Activity: Influence from the coronal mass ejection magnetic cloud is continuing to wane, with all solar wind parameters experiencing a gradual decline. There remains a chance of the late arrival of up to two coronal mass ejections later day 1 or day 2 (13/14 Aug) though these are thought to have most likely been encompassed within the aforementioned magnetic cloud experienced 12 Aug. Barring any coronal mass ejection influence, the fast wind from coronal hole 58 is likely to pass north of the Earth-Sun line with no appreciable enhancement expected, therefore solar winds should trend from slightly elevated back to slow-ambient.

Geomagnetic activity is expected to be mainly Quiet to Active (Kp 2-4) through the period. There remains a chance of up to two glancing coronal mass ejections through the remainder of day 1 or early day 2 (13/14 Aug), therefore bringing a chance of G1-G2/Minor-Moderate Storming (Kp 5-6), with a very slight chance of a G3/Strong storm (Kp 7) interval.

Energetic Particles / Solar Radiation: A heightened risk of flare activity brings the slight chance of reaching or exceeding Minor Radiation Storm levels should any significant flares

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occur.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	40	30	10	10
Strong	G3	Yes	10	5	1	1
Severe	G4	Yes	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	30	30	20	20
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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